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AUTHOR	Williams, Frederick; And Others
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ABSTRACT

The purpose of this study was to determine whether the two judgmental factors of "confidence-eagerness" and "ethnicity-nonstandardness" (previously identified from teachers' semantic differential evaluations of audio-taped samples of children's speech) would still be found when samples were presented in an audiovisual mode and whether these factors were pertinent to the differentiation of ethnic and social status. A set of 2-minute video-tapes made from interviews with six 11 and 12 year old boys from six ethno-status groups--Black middle and lower, Mexican-American middle and lower, and Anglo middle and lower--was presented as test stimuli to 102 undergraduate female Anglos who were asked to respond to a 59-item semantic differential scale. Some of the subjects were asked to respond to the audio mode, others to the video mode, and the rest to complete audio-visual conditions. Their responses implied that the two-factor model of confidence-eagerness and ethnicity-nonstandardness can be used in video-taped studies of children's speech. (Included are tabulations of adjectival pairs in the 59-item semantic instrument, subjects' responses to a semantic differential scale, and results of the two-factor analyses of confidence-eagerness and ethnicity-nonstandardness.) See also TE 002 001 and TE 002 002. (JM)

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SEMANTIC DIFFERENTIAL SCALING OF AUDIOVISUAL RECORDINGS OF CHILDREN'S SPEECH SAMPLES

FREDERICK WILLIAMS
JACK L. WHITEHEAD
JANE TRAUPMANN

TE002000

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PURPOSE

Previous research (Williams, in press) had indicated that teachers' semantic differential evaluations of audio-taped samples of children's speech resulted in the identification of two major judgmental factors: confidence-eagerness and ethnicity-nonstandardness. The main purpose in the present research was to determine whether such a judgmental model would be found when speech samples were presented in an audio-visual mode, and whether such factors (or any factors that were derived) were pertinent to the differentiation of Black (B), Mexican-American (M), and Anglo (A) children from families of middle and low social status.

METHOD

Subjects

Ss were 102 undergraduate female students enrolled in a course in speech for prospective teachers. Most were freshmen and sophomores, and Anglo.

Materials

Stimulus tapes. A set of six two-minute videotape stimuli was prepared, one for each of six ethno-status groups, Black-Middle (BM) and Lower (BL); Mexican-American-Middle (MM) and Lower (ML); and Anglo-Middle (AM) and Lower (AL). The stimuli were edited from black-and-white videotaped interviews of 11 and 12 year-old fifth and sixth grade boys who were representative of the six ethno-status groups, as drawn from the Austin, Texas area. The interviews, conducted in a living-room-like atmosphere by an Anglo woman identified as a teacher,

centered around two probes designed to elicit continuous discourse. The probes were: "Tell me about the television programs you like to watch," and "Tell me about the games you like to play." Thus each two-minute test tape contained either a boy's description of his favorite television program or a game he liked to play.

Semantic differential scales. A 59-item semantic differential was prepared by (1) having some 50 teacher-candidates write short paragraphs describing their reactions to a speech sample after seeing a tape in each of the above ethno-status categories, (2) collating adjectives from these paragraphs, combining them with adjectives from an earlier study (Williams, in press), then (3) pilot testing scales with some 30 teacher-candidates. The final experimental scales represented an edited (removing redundancies, etc.) version of the pilot scales. The 59-item instrument incorporated seven-step bipolar scales, and each scale gave Ss the further opportunity to check "NR" (not relevant). The 59 items are listed in Table 1.

Procedures

Testing involved the presentation of stimulus tapes to teachers (for semantic differential responses) in variations of presentation mode--viz. audio (Aud.) only, visual (Vis.) only, and audiovisual (AV) conditions. These three conditions, combined with three ethnic categories (B, M, and A), and two status levels (M and L), were administered to teacher-Ss in a Lindquist (1953) Type IV testing design. Within this design, each S saw three stimulus tapes; these were either all of M or L-status; one was in each of the Aud., Vis., and AV conditions; one each was representative of B, M, and A ethnic groups.

Testing was accomplished in small groups (five to 10Ss) in a conference-type room (approx. 10 by 20 feet) with tapes played on a 21" TV monitor. Ss were given standard instructions for the semantic differential (with the NR option) and were told that the task was to enable us (Es) to see how the children would differ in ratings. Testing for each subgroup took approximately 25 minutes.

RESULTS

Generality of the Two-Factor Model

Factor analysis. The first major inquiry as to factor structure of the judgments was undertaken as a factor analysis of the intercorrelations among the 59 semantic differential scales, where replicates in the correlations were teacher-Ss by stimuli (N = 306).[1] Unities placed in the diagonals of the correlation matrix, and factors with latent roots greater than one were rotated with Varimax criteria.

Results indicated the extraction of nine factors accounting for approximately 71% of the variance. A factor corresponding roughly to confidence-eagerness was dominant with 24% of the total variance, followed by a second factor identifiable as ethnicity-nonstandardness with 12% of the total variance. The remaining factors were minor and generally irrelevant to the present research interests.

Since evidence of the two expected factors was found in the first analysis, a more refined analysis was undertaken by reducing the variables to only those scales which had loaded relatively highly on the above two factors in the first analysis. This second analysis

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[1]The NR scale option, when taken, was treated as missing data.

resulted in two factors accounting for 70% of the total variance. The rotated factor matrix is presented in Table 2. As can be seen in this table, the confidence-eagerness and ethnicity-nonstandardness factors are clearly identifiable.

Factor structures by modes and ethnicities. Although the anticipated two-factor structure was found in the overall analysis, there was still the question of its relevance to each of the stimulus subsets. Accordingly, an additional factor analysis of intercorrelations among the reduced set of scale variables was run for each of the Aud., Vis., and AV conditions, and for each of the B, M, and A ethnic subsets.

Results of these analyses are summarized in Tables 3 and 4. Without exception, the same scales load highly on Factors I and II in the different mode conditions as well as in the different ethnicity conditions. Even the relative dominance of factors remains similar across the subsets, Factor I accounting on the average for 45% of the total variance and Factor II accounting for 25% of the total variance.

An economical way to describe the almost exact correspondence of the factors involves selecting pairs of analyses (e.g., Vis. and AV) and computing a matrix of cosines among the factor vectors for each pair (Veldman, 1967). These cosines represent the relationship between the factors after the two sets of scale vectors have been aligned for maximum contiguity. The Vis. and Aud. were paired with the AV condition and the B and M conditions were paired with the A condition using the above approach. Results presented in Tables 5 and 6 clearly show the high factor correspondence as was observed subjectively in Tables 3 and 4.

Factor reliability. As an estimate of factor reliability, a procedure was undertaken involving the calculation of intraclass correlations for selected scales on each factor, conversion to z-scores, averaging for each factor, then conversion back to a correlation coefficient for an estimate of reliability for each factor. These reliability coefficients were .821 for Factor I and .797 for Factor II. The scales incorporated in this analysis were five highest loading for each factor as identified in the results of the reduced scale variable analysis (Table 2). (A return to the overall analysis was thought justified upon the basis of finding very high similarity among the factor structures calculated for the data subsets, that is, the results shown in Tables 3 and 4.)

Scale rejection. It may be recalled that Ss had the option of rejecting certain scales as being not relevant to their differentiation of a given stimulus. Although the foregoing factor analyses are evidence of the relevance of the two factors to the mode and ethnicity conditions, it was nevertheless observed that there were occasional scale rejections. The question prompted by such rejections was whether they would reveal a pattern, say, where a given factor would tend to have a concentrated incidence of scale rejection under given conditions of stimulus ethnicity or mode. To answer this question the incidence of scale rejection among the reduced scale variable set was calculated for Factor I and Factor II so as to serve as a dependent variable in an analysis of variance incorporating stimulus mode, status, and ethnicity as independent variables. One such univariate analysis was conducted for Factor I and one for Factor II.

Results for Factor I indicated a significant main effect for mode, $F(2,180)=4.8, p<.01$; a significant mode-by-ethnicity interaction, $F(2,180)=5.5, p<.01$; and a significant three way interaction, $F(2,180)=4.1, p<.05$, involving mode-by-ethnicity-by-status. Interpretations were drawn from the three-way interaction. Considering the count of scale rejection as an irrelevance index, for confidence-eagerness ratings the highest rejection mean (.813) involved MM children being rated in the Vis. condition. The other most salient feature was that the AV condition had the lowest rejection index (.031) as compared with the Aud. (.208) and Vis. (.271) conditions. These mean figures represent rejections out of a possible 10.0, thus although there was some variation in rejection across the conditions of the experiment, the incidence of rejection was relatively low. If anything, there was only a slight tendency to have greater than average rejections in the Vis. condition, and this seemed to apply mostly to the MM child.

Results for Factor II rejections indicated only a significant main effect, $F(2,180)=342.9, p<.001$, for the mode variable. Inspection of the means indicated that scales on the ethnicity-nonstandardness factor were far more likely to be rejected in the Vis. condition (2.50), than in the Aud. (.188) or AV (.042) conditions. With a possible total of seven scales, this represents an approximate one-third rejection rate. Thus, if there is a question of the irrelevance of either factor to any of the conditions, the point of most potential irrelevance is for ratings of ethnicity-nonstandardness in the Vis. mode.

Differentiation of Children by Ethnicity and Status

To assess for differentiation of the stimulus conditions, factor scores were first calculated as a weighted combination of scales based upon factor loadings in the reduced variable analysis (Veldman, 1967); these scores were then subjected to a univariate analysis of variance for each factor.

Factor I, confidence-eagerness. All sources of variance except the mode main effect were significant in the analysis of variance. Most pertinent to interpretation was the significant, $F(2,180)=9.4, p<.01$, interaction of mode-by-ethnicity-by-status. The cell means for this interaction are presented in Table 7. As found in earlier use of the two-factor model (Williams, in press), the expectation was that children who had been selected a priori to represent middle and low status families would be differentiated by ratings on each of the two factors. With some exception--with M children in the Vis. and AV mode--children from the middle status group were consistently rated more favorable on confidence-eagerness than children from the low status group. As can be seen in Table 7, however, some of the differences are relatively small. Since the present experiment represented only one child in each category, it was not deemed worthwhile to undertake statistical generalizations based upon multiple mean comparisons in this table. The only gross generalization claimed is that a status differentiation was, for the most part, revealed.

Factor II, ethnicity-nonstandardness. The analysis of variance results did not reveal another three-way interaction in the case of Factor II, but did identify two two-way interactions. These were

between mode and ethnicity, $F(2,180)=12.5, p<.01$, and in mode-by-status $F(2,180)=17.4, p<.01$. In order to compare these results with those shown in Table 6 and because the two two-way interactions can be seen in this table, Table 8 presents the cell means for the mode-by-ethnicity-by-status conditions. The most marked feature in the pattern of the cell means is the lack of anticipated status differentiations in the Vis. mode. The mode-by-ethnicity interaction seems generally a function of a pattern whereby B children were rated lowest in the Aud. and AV conditions, as against A children being rated high in all three. The mode-by-status interaction seems generally a function of the lack of status differentiations in the Vis. mode, as against the presence of such differentiations in the other two modes.

In all, the results point to the generalization that Factor II or ethnicity-nonstandardness will not result in anticipated status differentiations when the child is seen but not heard. Although this may seem to belabor the obvious, earlier speculation (Williams, in press) as well as the emergence of the two-factor model in the present factor analyses of the Vis. condition suggests that teacher-Ss will use Factor II scales such as relate directly to speech even though they only see and do not hear the child. Such use, however, does not seem to result in the anticipated differentiation.

DISCUSSION

Primary implications of the present study refer to the reliability and validity of the two-factor model in teachers' evaluations of children's speech as presented on videotapes. Reliability was assessed

in terms of the consistent emergence of the two-factor model as well as in terms of indirect estimates based upon intraclass correlations. Validity was implied by interpretable status differentiations of the children. The results provide a basis for using this two-factor model in audiovisual studies of children's speech ratings, particularly where the AV stimulus mode is to be used.

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TABLE 1. **Adjectival pairs in the 59 scale instrument.**

	CHILD PROBABLY IS: eager to learn--"unmotivated" in school*
	CHILD IS: *ignored--listened to BY HIS PARENTS
	WORD USAGES ARE: *consistently-incorrect--consistently correct
	PARENTS SPEND: much--little time WITH THE CHILD*
	THE CHILD IS: highly-fluent--highly-disfluent*
	PARENTS PROBABLY ARE: interested--not interested IN CHILD*
	THE MEANING OF THE MESSAGE IS: *very-unclear--very clear
	CHILD LOOKS: *poorly dressed--neatly dressed
	CHILD LOOKS: attractive--unattractive*
1.#	CHILD SEEMS: *tense--relaxed
	IN THE CLASS THE CHILD PROBABLY: *does--does not DRAW ATTENTION TO HIMSELF
2.	PRONUNCIATION IS: *nonstandard--standard
	CHILD IS: liked--disliked BY HIS PEERS*
	CHILD IS: included--not included BY HIS PEERS*
	SENTENCES ARE: complex-elaborated--simple-unelaborated*
	CHILD'S LANGUAGE IS GENERALLY: *difficult--easy to UNDERSTAND
	CHILD IS: admired--ridiculed BY HIS PEERS*
	CHILD IS MOST OFTEN A: *follower--leader WITH HIS PEERS
	THE CHILD USES LANGUAGE: effectively--ineffectively*
	CHILD SEEMS: competitive--non-competitive*
	CHILD SEEMS TO: like--be indifferent to OTHER CHILDREN*
3.	THE CHILD'S FAMILY IS PROBABLY: *low-social-status--high-social-status
	THE AGE OF THE CHILD IS: seven, eight, nine, ten, eleven, twelve, thirteen, fourteen
	CHILD SEEMS: alert--indifferent*
4.	CHILD SEEMS: *hesitant--enthusiastic
5.	CHILD SEEMS: *shy--talkative
6.	THE CHILD'S SPEECH INDICATES: *a-poor educational-background--a-good-one
	CHILD'S HOME LIFE IS: very similar--very different FROM YOURS WHEN YOU WERE HIS AGE*
	VOCABULARY IS: *unsophisticated--sophisticated
7.	CHILD SEEMS TO BE: interested--uninterested IN HIS ENVIRONMENT*
	CHILD FEELS PARENTS: care--don't care ABOUT HIM*
	CHILD WOULD PROBABLY BE: *hostile--accepting TO A TEACHER LIKE YOU
	THE MESSAGE PRESPECTIVE IS: seldom-tied-to-speaker--solely-tied-to-him*
	USUALLY THE CHILD: succeeds--fails IN WHAT HE TRIES TO DO*
	CHILD SEEMS: intelligent--unintelligent*
	CHILD'S RELATIONSHIP WITH HIS PARENTS PROBABLY IS: close--distant*

*The asterisks define the pole of the scale assigned a value of 1.0 in the quantification scheme. The asterisks did not appear on the actual instrument.

#The number next to each scale is the scale index for the reduced factor analyses (Tables 2-4).

8. CHILD SEEMS TO BE: observant--not observant*
   THE OVERALL MESSAGE IS: *disorganized--organized
   CHILD PROBABLY SPENDS: large--small AMOUNT OF TIME AWAY FROM HOME*
9. LANGUAGE SPOKEN IN THIS CHILD'S HOME IS PROBABLY: standard American style--marked ethnic style*
   CHILD WOULD PROBABLY BE: *withdrawn--outgoing WITH A TEACHER LIKE YOU
   PARENTS ENCOURAGE CHILD TO DO WELL IN SCHOOL: a great deal--not at all*
10. CHILD SEEMS TO: enjoy--dislike TALKING*
    SENTENCES ARE: *fragmentary--complete
    CHILD WOULD PROBABLY: modify his behavior--refuse to modify his behavior in RESPONSE TO DISCIPLINARY ACTIONS FROM A TEACHER LIKE YOU*
11. THE CHILD SEEMS CULTURALLY: *disadvantaged--advantaged
    CHILD FEELS HE: has much--has little CHANCE TO MAKE GOOD IN THE WORLD*
    CHILD WOULD: respect--disrespect A TEACHER LIKE YOU AFTER HE WAS JUSTIFIABLY DISCIPLINED*
12. CHILD IS: happy--sad*
    CHILD IS: determined--not determined IN SCHOOL*
13. THE CHILD SEEMS: *reticent-to-speak--eager-to-speak
    THE MESSAGE IS: rich-in-detail--sparse-in-detail*
14. CHILD IS: active--passive*
    CHILD IS: *slow--quick
15. THE CHILD SEEMS: confident--unsure*
16. CHILD IS: *dull--alert
    PRONUNCIATION IS: *unclear-indistinct--clear-distinct
17. THE LANGUAGE SHOWS A: standard-American-style--marked-ethnic-style*
    THE GRAMMAR IS: *quite-bad--quite-good

TABLE 2. **Rotated factor matrix of teacher responses to 17 semantic differential scales.**

Variables	Factors I.	II
1. relaxed	.77	.11
2. pronun. std.	.22	.70
3. fam. high soc. status	.23	.80
4. enthusiastic	.84	.16
5. talkative	.83	.18
6. ed. bkg. good	.46	.73
7. interested	.76	.19
8. observant	.76	.29
9. home lang. std. Am.	.07	.90
10. enjoys talking	.85	.18
11. cult. advant.	.35	.80
12. happy	.73	.24
13. eager-to-speak	.83	.22
14. active	.86	.18
15. confident	.81	.32
16. alert	.78	.24
17. lang. std. Am.	.09	.90
(Percentage total variance)	44%	26%

TABLE 3. **Factor analyses of 17 scales in each of three mode conditions.**

Scales	AV		Aud.		Vis.	
Factor I	I	II	I	II	I	II
1. relaxed	.73	.16	.73	.07	.86	-.01
4. enthusiastic	.86	.07	.84	.24	.85	.12
5. talkative	.77	.27	.86	.14	.88	.05
7. interested	.72	.32	.79	.12	.84	.19
8. observant	.76	.29	.73	.29	.82	.29
10. enjoys talking	.87	.17	.83	.12	.90	.15
12. happy	.58	.32	.80	.34	.81	.09
13. eager-to-speak	.87	.21	.76	.22	.88	.09
14. active	.84	.20	.84	.20	.88	.11
15. confident	.78	.33	.80	.39	.86	.18
16. alert	.72	.31	.83	.25	.82	.11
Factor II						
2. pronun. std.	.18	.74	.29	.65	.05	.73
3. fam. high soc. status	.35	.72	.23	.84	.19	.81
6. ed. bkg. good	.44	.76	.54	.67	-.19	.89
9. home lang. std. Am.	.15	.91	.04	.87	.10	.88
11. cult. advant.	.40	.78	.37	.83	.37	.79
17. lang. std. Am.	.08	.91	.04	.89	.30	.99
(Percentage total variance)	42%	27%	45%	26%	49%	27%

TABLE 4. Factor analyses of 17 scales in each of ethnicity subset conditions.

Scales	B		M		A	
Factor I	I	II	I	II	I	II
1. relaxed	.75	.26	.76	.05	.71	.11
4. enthusiastic	.82	.04	.90	.11	.82	.23
5. talkative	.83	.18	.82	.14	.81	.21
7. interested	.86	.18	.73	.29	.61	.33
8. observant	.83	.17	.72	.38	.63	.41
10. enjoys talking	.89	.06	.87	.16	.73	.37
12. happy	.79	.20	.64	.28	.78	.20
13. eager-to-speak	.90	.13	.77	.15	.83	.20
14. active	.86	.20	.87	.22	.81	.23
15. confident	.81	.34	.79	.31	.86	.27
16. alert	.81	.26	.80	.13	.72	.42
Factor II						
2. pronun. std.	.19	.63	.14	.73	.47	.49
3. fam. high soc. status	.26	.60	.23	.75	.13	.82
6. ed. bkg. good	.48	.58	.48	.73	.52	.72
9. home lang. std. Am.	-.05	.82	.02	.89	.22	.84
11. cult. advant.	.35	.68	.37	.76	.35	.79
17. lang. std. Am.	-.02	.82	.09	.91	.15	.85
(Percentage total variance)	48%	20%	43%	26%	42%	26%

TABLE 5. Factor correlations of I and II in AV condition with similar factors in Aud. and Vis. conditions.

		Vis.		Aud.	
		I	II	I	II
AV	I	.9986	-.0538	.9996	.0288
	II	.0538	.9986	-.0288	.9996

TABLE 6. Factor correlations of I and II in A condition with similar factors in B and M conditions.

		B		M	
		I	II	I	II
A	I	.9989	.0478	.9999	.0152
	II	-.0478	.9989	-.0152	.9999

TABLE 7. Cell means of Factor I scores in mode-by-ethnicity-by-status interaction.

Ethnicity:	B		M		A	
Status:	M	L	M	L	M	L
Aud. Mode:	.84	-.26	-.33	-.47	.62	.36
Vis. Mode:	.99	-1.56	.09	.19	.26	-.24
AV Mode:	.73	-.52	-.88	-.02	.60	-.11

TABLE 8. Cell means of Factor II scores in mode-by-ethnicity-by-status conditions.

Ethnicity:	B		M		A	
Status:	M	L	M	L	M	L
Aud. Mode:	-.50	-1.26	.55	.07	.82	.34
Vis. Mode:	-.57	-.12	-.27	-.07	.53	.53
AV Mode:	-.57	-1.27	.52	-.35	1.06	.19